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Hands On Tutorial with MongoDB

This is a hands on backup document for the Software Engineering course Mini topic MongoDB presentation on mongoDB with team 25.

This tutorial discusses briefly on how databases with MongoDB are modeled as database schema and what possible simple CRUD operations could be done with the document oriented database management system. The document focuses only on the basics of the database technology.

1 Database Structure (Schema Design)

1.1 Concept Overview – Referenced vs Embedded

- Referenced - Normalized

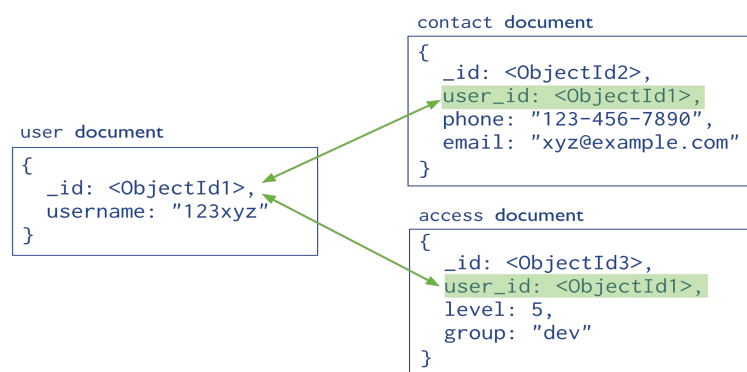


Figure 1: Data model using references similar to [Relational DBMS Schema](#)¹

- Embedded – De-Normalized



Figure 2: Data model with embedded schema structure- Embedded Data Model²

¹ Data Model Design for MongoDB Release 2.4.8 page 7

² Data Model Design for MongoDB Release 2.4.8 page 6

Referencing (Relational)	Embedding (Document)
has_one	embeds_one
belongs_to	embedded_in
has_many	embeds_many
has_and_belongs_to_many	

2 CRUD Operations

(with sample contacts database for a Business Card)

Embedded Schema

Contact
name company address <ul style="list-style-type: none"> • Street • City • State • Zip title phone

Start Mongo DB

Opening/Creating DB

```
$ mongo
```

```
$ mongo db_name
```

Viewing DBs

```
> show dbs
```

Using DB

```
> use db_name
```

Show Collections

```
> show collections
```

Create – insert() | save() | update()

```
> db.contact.insert({"name": "Carl Sagan", "title": "Board of Trustees, SETI Institute",
"company": "Search for Extra-Terrestrial Intelligence (SETI)", "address": {"street": "189
Bernardo Ave, Suite 100", "city": "Mountain View", "state": "CA", "zip_code":
"94043"}, "phone": "650-961-6633"})
```

```
> db.contact.insert({"name": "Obi-Wan Kenobi", "title": "Jedi Master, Jedi Council",
"species": "Human", "affiliation": "Jedi Order, Galactic Republic", "address":
{"Homeworld": "57 BBY, Stewjon", "universe": "Star Wars Universe", "school": "Jedi
Council", }, "phone": "000-011-0007", })
```

```
> db.contact.insert({"name": "Kent Beck", "url": "http://www.threeriversinstitute.org",
"title": "Chief Scientist, Iterate AS", "company": "Iterate AS", "email":
"kent@threeriversinstitute.org", "address": {"street": "Three Rivers 128", "city": "Merlin",
```

```
"state": "Oregon", "zip_code": "97532"} "phone": "541-472-0357", "fax": "550-330-0100"}))
```

Read – find() | findOne()

```
> db.collection_name.find()
> db.collection_name.find({"param0" : , "param1" })

> db.contact.find( { name: "Carl Sagan"} ).limit(5)
> db.contact.find()
```

Update – update() | save()

```
> db.collection.update( criteria, objNew, upsert, multi )

> db.contact.save({name: "Obi-Wan Kenobi", title: "Jedi Master, Jedi Council", species:
"Human", affiliation: "Jedi Order", address: { homeworld: "57 BBY, Stewjon", universe:
"Star Wars Universe", school: "Jedi Council"}, phone: "090-000-011-0007", })
```

Delete – remove() | drop()

```
> db.collection.remove()
> db.contact.remove( { name : "Obi-Wan Kenobi"  })
```

Deleting Databases

```
> use contact;
> db.dropDatabase();
```

Help

```
> help
> db.help()
> db.collection_name.help()
```

3 MongoDB Web UI

<http://rockmongo.com/>

4 MongoDB Trainings

MongoDB University
<https://education.mongodb.com/>

5 Data View

Contact Database

Document One - Carl Sagan

```
{
  "name": "Carl Sagan",
  "title": "Board of Trustees, SETI Institute",
  "company": "Search for Extra-Terrestrial Intelligence (SETI)",
  "address": {
    "street": "189 Bernardo Ave, Suite 100",
    "city": "Mountain View",
    "state": "CA",
    "zip_code": "94043"
  }
}
```

```
    },  
    "phone": "650-961-6633"  
  }  
}
```

Document Two - Kent Beck – with variation of fields

```
{  
  "name": "Kent Beck",  
  "url": "http://www.threeriversinstitute.org",  
  "title": "Chief Scientist, Iterate AS ",  
  "company": "Iterate AS",  
  "email": "kent@threeriversinstitute.org",  
  "address": {  
    "street": "Three Rivers 128",  
    "city": "Merlin",  
    "state": "Oregon",  
    "zip_code": "97532"  
  }  
  "phone": "541-472-0357",  
  "fax": "550-330-0100"  
}
```

Document Three - Obi-Wan Kenobi

```
{  
  "name": "Obi-Wan Kenobi",  
  "title": "Jedi Master, Jedi Council ",  
  "species": "Human",  
  "affiliation": "Jedi Order, Galactic Republic",  
  "address": {  
    "Homeworld": "57 BBY, Stewjon",  
    "universe": "Star Wars Universe",  
    "school": "Jedi Council",  
  },  
  "phone": "000-011-0007",  
}
```